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chart of the path of the orbits of the comets, which is conclusive in its exhibition of the relation of the comets to the solar system.

Dr. J. C. Warren and Dr. Channing continued a discussion which commenced at the last meeting, on the comparative merits and safety of ether and chloroform as anæsthetic agents.

### Three hundred and nineteenth meeting.

### May 8, 1849. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary presented a memoir from William S. Sullivant, Esq., entitled "Contributions to the Bryology and Hepaticology of the United States, Part II.," comprising the descriptions of several new or little known Musci and Hepaticæ, illustrated by figures.

Professor Agassiz gave a summary account of his investigations upon Medusæ. He has ascertained that their body consists entirely of cells, preserving in all the different systems of organs their character as true cells, and nevertheless performing very different functions. He showed that there is a complete system of bundles of elongated cells, arranged in longitudinal and transverse series, acting as muscles, and disposed in several layers, one being superficial and another lining the inner surface of the disk in Discophoræ, whilst some penetrate at various depths the gelatinous mass. The nervous system consists of a circular cord of oval cells, extending along the lower margin of the disk, from one eye-speck to the other, and forming a ganglion at the base of each. He also showed that the digestive system is naturally distinct from the tubes through which the digested food, mixed with water, is circulated, though at times they communicate directly with each other. This circulation — the arrangement of which he has ascertained by artificial injection — is very complicated in

Ctenophoræ, as there are peculiar tubes for each row of combs, for the netting apparatus, for the stomach, for the mouth, and for the ocular bulb. He further showed that the walls of the digestive and circulating cavities are cellular, like the other parts of the body, and that the gelatinous mass itself is divided into large cells by partitions similar to the hyaline membrane of the vitreous body of the eye. He also illustrated the various modes of development of these animals, and described the successive changes of their alternative generations in the *Tiaropsis diademata;* the embryo of which he has seen escape from the ovary, move about free for some time, and finally attach itself and grow into a polyp-like animal with tentacles, the first stage of growth of a Campanularia, which is its other mode of existence. He finally enumerated the species of Ctenophoræ and naked-eyed Discophoræ which he has observed in Boston Bay, referring them to the modern genera to which they belong, viz. *Pleurobrachia rhododactyla*, *Bolina alita*, *Staurophora laciniosa*, *Bougainvillea superciliaris*, *Sarsia mirabilis*, and *Tiaropsis diademata*, pointing out the differences by which they are distinguished from the species already described, and the generic characteristics of the new type he has recognized among them. The discovery of a new species of Staurophora on these shores is a new instance of the remarkable analogy which exists between the fauna of the Atlantic States and that of the northeastern shores of Asia.

Dr. B. A. Gould made some remarks on the comet now visible, which had passed remarkably near the earth during the last week. He had, however, in spite of this near approach, heard of but two observers who had seen it with the naked eye, namely, Mr. Bond, in Cambridge, and a gentleman in Salem.

"The first rough elements deduced from observation, within two days after its discovery, were so strikingly similar to those deduced by Bessel (*Berliner Astronomisches Jahrbuch*, 1809, p. 99) from Klinkenberg's observations of the second comet of 1748, as to lead to strong suspicion of the identity of those two bodies. The following are the third parabolic elements computed for this comet, (originally published by S. C. Walker, Esq., in the *National Intelligencer* of April 26th,) from Cambridge observations, April 11th, 14th, and 19th, and Bessel's elements for the comet of 1748.

| 1848. Mean Berlin Time. | | 1748. Mean Paris Time. | |
|---|---|---|---|
| $T$ | June $8^{d}.23220$ | $T$ | $18^{d}.89401$ |
| ☊ | 30° 32′ 7″ | ☊ | 33° 8′ 29″ |
| $i$ | 66 55 12 | $i$ | 67 3 28 |
| $\pi$ | 267 13 6 | $\pi$ | 278 47 10 |
| $q$ | 0.892703 | $q$ | 0.625357 |
| Motion direct. | | Motion direct. | |

" The discrepancies between these two orbits are not greater than the uncertainties of the latter, except as regards the perihelion distance. Both comets were very favorably situated for determination of the perihelion distance, and on mature consideration I am convinced, that, unless it can be shown that the comet had been exposed to perturbations, by the earth or Jupiter, capable of producing a very great change in the perihelion distance, all arguments, drawn from the similarity of the elements, in favor of the identity of the two comets, must fall to the ground. In both cases, the comets approached quite near the earth, and were observed in the ecliptic; but in 1748 the comet crossed this plane so far *inside* the earth's orbit, and in 1849 so far *outside* of the same, that all attempts to attribute the discrepancy of the perihelion distances to errors of observation or computation, in either case, must be fruitless.

" It must, nevertheless, be acknowledged that the resemblance of the two orbits is greater than exists between those of any other two comets on record. In order, therefore, to discover whether any indication of periodicity were to be found in the orbit itself, application was made to Mr. Bond, of the Cambridge Observatory, for three observations, as remote from one another as possible; and from observations on April 11th, 19th, and 27th, I computed an orbit by Gauss's method, without any hypothesis whatever as to the nature of the conic section described. The resulting curve was no ellipse at all, but the following hyperbola.

☊ 30° 11′ 11″
$i$ 67 19 39
$\pi$ 266 16 36
$\psi$ 10 6 1

" Even the magnitude of the resulting eccentricity cannnot be considered as proving the curve described to be actually a hyperbola. On the contrary, I fully coincide with the views which Professor Peirce has developed at a late meeting of the Academy, with regard to the non-hyperbolism of any of the cometary orbits on record. I can only say, that no curve but a hyperbola can be drawn *precisely* through the three places given by the observations on which my calculations were based. None of the observations had been made in the meridian, and a small change in the fundamental places would change the character of the curve very considerably. I believe, however, that the evidence is sufficient to prove that the comet was not moving in any ellipse whose eccentricity differs sufficiently from unity to enable us to deduce the period, and am convinced that no hypothesis of identity with Klinkenberg's comet of 1748 could be supported. It must moreover be observed, that, during the whole of the period comprised between the fundamental observations, the comet was approaching the earth, whose attraction must, in consequence of its proximity, have been powerful, and was to be added to that of the sun. The increased velocity thus imparted to the comet might give temporarily a hyperbolic aspect to the orbit."

Dr. Gould then spoke of the comet observations quoted in Struyck and Pingré as having been made by Kindermann in Dresden, and a Dutch navigator at the Cape of Good Hope, in the spring of 1748. He had attempted to reconcile them with the orbits of the two authentic comets of that year, but entirely in vain.

## DONATIONS TO THE LIBRARY,

### FROM JUNE, 1848, TO MAY, 1849.

*Edward Everett.* Eulogy on the Life and Character of John Quincy Adams, delivered at the Request of the Legislature of Massachusetts, in Faneuil Hall. 8vo. pamph. From the Author.

*J. L. and Henry C. Lord.* Defence of Dr. C. T. Jackson's Claims to the Discovery of Etherization. 8vo. pamph. From the Authors.

*Dr. L. P. Yandell and Dr. B. F. Sheemard.* Contributions to the Geology of Kentucky. 8vo. pamph. From the Authors.

Observations upon a Greek Vase discovered in Etruria, bearing the

Name of the Fabricator, Nicosthenes, in the Possession of the Marquis of Northampton. 4to pamph. From the Author, through Mr. Everett.

*Wm. Whewell, D. D.* The Philosophy of the Inductive Sciences, founded upon their History. A new Edition. 2 vols. 8vo. From the Author.

Transactions of the American Antiquarian Society. Vol. II. 8vo. From the Society.

A Catalogue of the Books in the Library of the American Antiquarian Society, in Worcester, Massachusetts. From the Society.

Nachrichten von der Georg-Augusts-Universitäts und der Königl. Gesellschaft der Wissenschaften zu Göttingen, vom Jahre 1846. — Nachrichten, etc., vom Jahre 1847. 4to. From the Royal Society of Sciences of Göttingen.

Abhandlungen der Königl. Gesellschaft der Wissenschaften zu Göttingen. Band III. 4to. 1845-47. From the Royal Society of Sciences of Göttingen.

*Professor J. F. Hausmann.* Bemerkungen über Gyps und Kanstenit. (Extr. Abhand. Königl. Gesellsch. Wissenschaften zu Göttingen, Band III.) From the Author.

Mémoires de la Société de Physique et d'Histoire Naturelle de Genève. Tome XI. (in two Parts). 4to. From the Society.

The American Journal of Science and Arts, for July, 1848. From the Editors.

Annual Report of the Regents of the University of the State of New York, made to the Legislature, March 2, 1848. 8vo. Albany. From the Regents.

Message of his Excellency, Governor Briggs, transmitting the Report of Benjamin Perley Poore, employed in France as Historical Agent of the Commonwealth of Massachusetts, &c. 8vo. pamph. From Mr. Poore.

Transactions of the Royal Irish Academy. Vol. XXI., Part 2. 4to. Dublin, 1848.

Charts of the Coast Survey of the United States. From the Hon. J. G. Palfrey, and from the Clerk of the House of Representatives.

*Sears C. Walker.* Ephemeris of Neptune for the Opposition of 1848. (Smithsonian Contributions to Knowledge.) 4to pamph. From the Smithsonian Institution.

*Hon. Captain W. H. Smyth, R. N.* Description of an Astrological

Clock belonging to the Society of Antiquaries. 8vo. pamph. London, 1848. From the Author.

The American Journal of Science and Arts, for November, 1848. From the Editors.

*B. A. Gould.* Untersuchungen über die Gegenseitige Lage der Bahnen der zwischen Mars und Jupiter sich bewegenden Planeten. 8vo. pamph. Göttingen, 1847. From the Author.

Annual Report of the Regents of the University of the State of New York, on the Condition of the State Cabinet of Natural History, with Catalogues of the same. 8vo. Albany, 1848. From the Regents. Also a copy from Professor James Hall.

Reduction of Greenwich Lunar Observations, for the Years 1750 to 1830. 2 vols. 4to. From the Royal Society, London.

Greenwich Magnetical and Meteorological Observations, for 1845. 4to. From the Royal Society, London.

Magnetische und Meteorologische Beobachtungen zu Prag. Jahrg. 8. Jan.-Dec., 1847. Prague, 1848. From the Observatory of Prague.

Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen. Band III., von der Jahren 1845-1847. 4to. From the Royal Society of Göttingen.

Annals of the Lyceum of Natural History, New York. Vol. IV., Part 2. 8vo. New York, Sept., 1848. From the Lyceum.

*Frederick Emerson.* Communication to the American Academy of Arts and Sciences, relative to a late Report on the Subject of Ventilators and Chimney-Tops. 8vo pamph. Boston, 1848. From the Author.

*Henry Piddington.* The Sailor's Horn-Book for the Law of Storms in all Parts of the World. 12mo. New York and London, 1848. From the Author, through W. C. Redfield.

Smithsonian Contributions to Knowledge, Vol. I. Viz. Ancient Monuments of the Mississippi Valley, by E. G. Squier, A. M., and E. H. Davis, M. D. 4to. 1848. From the Smithsonian Institution.

*Alexandre Vattemare.* Report on the Subject of International Exchanges. 8vo pamph. Washington, 1848. From the Author.

*Charles Cramer.* Bescreibung der in der Grossen Knochen Höhle Tennessee gef undenenFossilen Knochen des Megalonyx laqueatus, etc. From the Author.

Flora Batava; Afbeelding en Beschrijzing van Nederlandsche Gewassen, door Jan Kops, en J. E. van der Trappen. Aflev. 147, 148, 149, 150, 151. 4to. Amsterdam. From the Netherlands Government.

*F. G. W. Struve.* Stellarum Duplicium et Multiplicium Mensuræ Micrometricæ per Magnum Fraunhoferi Tubum, Annis 1824–37, in Specula Dorpatensi Institutæ; Adjecta est Synopsis Observationum de Stellis Compositis Dorpati Annis 1814–24 per minora Instrumenta perfectorum. Editæ jussu et expensis Acad. Sci. Cæsar. Petropolitanæ. Petrop., 1837. From the Author.

*F. G. W. Struve.* Description de l'Observatoire Astronomique Central de Poulkova. St. Petersbourg, 1845. 4to. With a folio volume of Plates, &c. From the Imperial Observatory of Pulkova.

*F. G. W. Struve.* Expedition Chronométrique executée en 1843 entre Poulkova et Altona, &c. St. Petersbourg, 1844. From the Imperial Observatory of Pulkova.

Astronomische Ortsbestimmungen in der Europäischen Türkel, in Kaukasien und Klein-Asien, etc., in der Jahren 1828 bis 1832. Angestellten Astronomischen Beobachtungen, etc., von F. G. W. Struve. St. Petersburg, 1845. From the Imperial Observatory of Pulkova.

*F. G. W. Struve.* Catalogus Librorum Speculæ Pulgovensis, 1845. From the Imperial Observatory of Pulkova.

*F. G. W. Struve.* Table des Positions Géographiques Principales de la Russie. St. Petersbourg, 1843. From the Imperial Observatory of Pulkova.

*F. G. W. Struve.* Sur le Coefficient Constant dans l'Aberration des Etoiles Fixes, etc. St. Petersbourg, 1843. From the Imperial Observatory of Pulkova.

*F. G. W. Struve.* Catalogue de 514 Etoiles Doubles et Multiples découvertes sur l'Hémisphère Céleste Boréal par la Grand Lunette de l'Observatoire Central de Poulkova : et Catalogue de 256 Etoiles Doubles Principales où la Distance des Composantes est 32 Secondes à 2 Minutes. Publiée par l'Acad. Imp. Sci. St. Petersb. 1843. From the Imperial Observatory of Pulkova.

*M. Weisse.* Catalogus Stellarum ex Zonis Regiomontanis. (Edit. F. G. W. Struve.) Petrop., 1846. From Professor Struve.

*Walter Channing, M. D.* On Etherization in Childbirth. 8vo. Boston, 1848. From the Author.

Topographical Engineers' Papers, No. 2. Determination of the Latitude with Zenith and Equal Altitude Telescopes, by Captain T. J.

Lee, U. S. Corps Topog. Engineers. 4to pamph. Washington, 1848. From the Topographical Bureau.

*Charles Martins.* Instructions pour l'Observation des Trombes Terrestres. (Extr. de l'Annuaire Météorologique de la France, 1848.) From the Author.

*Edward Desor.* Embryology of Nemertes, with an Appendix on the Embryonic Development of Polynoë. (Extr. Jour. Bost. Nat. Hist. Society.) From the Author.

American Journal of Science and Arts. No. 19. New Series. For January, 1848. From the Editors.

Abhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin: aus dem Jahre 1846. 4to. Berlin, 1848. From the Berlin Academy.

Monatsbericht der Königl. Preuss. Akademie der Wissenschaften zu Berlin. July-Dec., 1847, and January-June, 1848. 8vo. From the Berlin Academy.

Denkschriften der Allgemeinen Schweitzerschen Gesellschaft für die gesammten Naturwissenschaften. Band I. 4to. Zurich, 1829-33. Neue Denkschriften Schweitz. Gesellsch., etc. Bände I.-IX. 4to. Neuchatel, 1837-47. From the Helvetian Natural History Society.

*Francis Wayland, D. D.* The Elements of Moral Science. Boston, 1849. — The Elements of Political Economy. Boston, 1848. — Thoughts on the Present Collegiate System in the United States. Boston, 1842. — Sermons delivered in the Chapel of Brown University. Boston, 1849. — 12mo. From the Author.

Smithsonian Contributions to Knowledge. Occultations visible in the United States during 1849, computed under the Direction and at the Expense of the Institution, by John Downes. 4to pamph. Washington, 1848. From the Smithsonian Institution.

Proceedings of the Academy of Natural Sciences, Philadelphia. Vol. IV., Nos. 3-7. 8vo. 1848.

Charter of the Boston and Lowell Railroad Corporation, and Report of the Directors to the Legislature, 1848. 8vo pamph. Boston, 1849.

*Edward Everett.* Correspondence relative to the Award of the King of Denmark's Comet-Medal to Miss Maria Mitchell of Nantucket, for the Discovery of a Telescopic Comet, on the 1st of October, 1847. 8vo pamph. [Not published.] Cambridge, 1849. From the Author.

Report of the Stockholders of the Dauphin and Susquehanna Coal Company. Philadelphia, 1848.

*Dr. J. C. Flügel.* Literarische Sympathien öder Industriel Buchmacherei, ein Beitrag zur Geschichte der Neueren Englischen Lexicographie von Dr. J. G. Flügel. Leipsic. With other pamphlets on the same subject. From the Author.

*Edward Everett.* Speech in Support of the Memorial of Harvard, Williams, and Amherst Colleges, delivered before the Joint Committee on Education, in the Hall of the House of Representatives, Boston, February 7th, 1849. 8vo pamph. From the Author.

Report on the Memorial of W. T. G. Morton, and the Remonstrance of Dr. Charles T. Jackson. 8vo pamph. Congressional Document, No. 114. From the Author.

Annals of the Lyceum of Natural History, New York. Vol. IV., No. 5. Feb., 1846. 8vo. New York, 1846. From the Lyceum.

*Joseph Leidy, M. D.* Observations on the Existence of the Intermaxillary Bone in the Embryo of the Human Subject. Pamph. From the Author.

Annual Report of the Trustees of the State Library of the State of New York; made to the Legislature, January 15, 1849. 8vo. Albany, 1849. From the Regents of the University of the State of New York.

Proceedings of the Friends of a Railroad to San Francisco, at a Public Meeting, Boston, April 19, 1849. Second Edition. Pamph. Boston, 1849.

Proceedings of the American Philosophical Society. Vol. V., No. 42. January to March, 1849. 8vo. Philadelphia. From the Society.

*A. D. Bache.* Report of the Superintendent of the United States Coast Survey. December, 1848. Congressional Document. From Hon. Robert C. Winthrop.

*J. C. Fremont.* Geographical Memoir upon Upper California; in Illustration of his Map of Oregon and California; addressed to the Senate of the United States. With the Map. Congressional Document. Washington, 1849. From Hon. R. C. Winthrop.

*A. Guyot.* The Earth and Man. Lectures on Comparative Physical Geography in its Relation to the History of Mankind. 12mo. Boston, 1849. From the Author.

Reports from the Secretary of the Treasury of Scientific Investigations in Relation to Sugar and Hydrometers, made under the Superintendence of Professor A. D. Bache, by Professor R. S. McCulloh. Congressional Document. 8vo. Washington, 1848. From the Comptroller's Office, Washington.

*Samuel Geo. Morton, M. D.* Additional Observations on a New Living Species of Hippopotamus of Western Africa. (Extr. Jour. Acad. Nat. Sci. Philad.) 4to. Philadelphia, 1849. From the Author.

Smithsonian Contributions to Knowledge. App. I. to Vol. II.; containing an Ephemeris of the Planet Neptune for the Date of the Lalande Observations of May 8th and 10th, 1795, and for the Oppositions of 1846, 1847, 1848, and 1849. Computed by Sears C. Walker. 4to pamph. Washington, 1849. From the Smithsonian Institution.

Annals of the Lyceum of Natural History, New York. Vol. V., No. 1. 8vo. May, 1849. From the Lyceum.

Journal of the American Oriental Society. Vol. I., No. 4. 8vo. New Haven, 1849. From the Society.

Verhandlungen der Kaisersl. Leopold.-Carol. Akademie der Naturforscher. Band XXIII. Suppl. Enthal. F. A. W. Miquël Illustrationes Piperacearum. 4to, with 92 Plates. Band XXIV. 4to. Breslau and Bonn, 1846, 1847. From the Acad. Naturæ Curiosorum.

*Augustus Mason, M. D.* The Cholera : Brief Hints for its Prevention, &c., &c. 8vo pamph. Lowell, 1849. From the Author.

*Professor Von Boguslauski.* On a New Micrometer and its Application to the Determination of the Parallax of Mars. (Ext. from the Transactions of the Royal Astronomical Society, London.) 4to pamph. From the Author.

Uranus, Synchronistisch geordenete Ephemeride aller Himmelserscheinungen des Jahr. 1849. Erstes und Zweites Quartal. 8vo. Breslau, 1849. From the Editor.

Übersicht der Arbeiten und Veranderungen der Schlesischen Gesellschaft für Vaterlandische Kultur im Jahre 1847. 4to. Breslau, 1848. From Professor Boguslauski.

Sixty-second Annual Report of the Regents of the University of the State of New York; made to the Legislature, March 1st, 1849. 8vo. From the Regents.

American Journal of Science and Arts. Second Series, No. 22. July, 1849. From the Editors.

*E. B. O'Callaghan.* Documentary History of the State of New

York; arranged under the Direction of the Hon. C. Morgan, Secretary of State. Vol. I. 8vo. Albany, 1849.

*B. A. Gould, Jr.* Account of the Observatory of Pulkova; as written for the North American Review, July, 1849. 8vo pamph. From the Author.

*Jas. O. Halliwell.* Rara Mathematica: or a Collection of Treatises on the Mathematics and Subjects connected with them. From Ancient inedited Manuscripts. Second Edition. London, 1841. From the Editor.

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### Three hundred and twentieth meeting.

### May 29, 1849. — ANNUAL MEETING.

The PRESIDENT in the chair.

Mr. Everett announced that the comet discovered by Mr. George P. Bond, on the 11th of April last, at nine o'clock, P. M., was observed at Moscow, on the same evening, at half past nine o'clock. It was also seen in England, by Mr. Graham, on the 14th of April.

A memoir, "On some Applications of the Method of Mechanical Quadratures," by George P. Bond, was communicated.

Professor Agassiz gave a further exposition of his observations on the structure and devolopment of the Medusæ.

A letter was read from Mr. Henry Dexter, the sculptor of the marble bust of the former President of the Academy, the late Hon. John Pickering, LL. D., recently placed in the hall, inclosing the list of the subscribers by whom this memorial was procured and presented to the Academy.

The Treasurer's Annual Report, with the auditor's certificate, was read and placed on file; and the appropriations for the current year, as proposed by the Treasurer, were voted.

Professor Charles U. Shepard, and Professor Charles B. Adams, of Amherst College, were elected Fellows of the Academy.

The annual election was held, and the following officers were chosen for the ensuing year, viz.: —